TAF Wind Shear Documentation

Version 1.0
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Location:

This application can be downloaded from the Local Application Database at:
http://140.90.90.253/~applications/LAD/generalappinfoout.php3?appnum=1898

Introduction:

The main purpose of this program is to serve as a situational awareness tool for aviation forecasters constructing TAFs. This program contains a Perl script that interrogates NAM Bukit data files for low level wind shear conditions. Output files are generated for display on the web and in AWIPS text windows. Text workstations can then be set to alarm if shear conditions are met. Please see the example output at the end of this document. As with any type of model data, use this for guidance purposes only! This is a tool that should lead you to further "investigate" the possibility for shear.

Requirements:

Bufkit data files must be accessible in AWIPS for this program to run. Pulling Bufkit files from LDAD is probably the best way to go here.

Recommendations:

This program is best utilized by running it as part of a c shell on a cron. The c shell should then copy the output files to the AWIPS text database. Text workstations can then be set for visual or audible alarms if certain criteria are met.

Specifics:

The TAF Wind Shear program will examine Bufkit model data from all 4 cycles of the NAM for low level wind shear conditions. Output for each Bufkit location is output into a separate file. These files can be displayed on the web, or in AWIPS text windows as each location will have a unique PIL. There is also an optional logging function.

This program will calculate wind shear magnitude between the surface and each 100 foot increment up to 2000 feet agl. The output files will then display the maximum wind shear magnitude for each hour out to the user specified forecast hour (default is 30 hours). The surface wind used in the calculation is also listed for each hour.

A suggested TAF entry is also listed for each hour. This TAF entry is simply the wind data from the level deemed the maximum shear level. You will notice that the TAF entry output has a bias towards

2000 feet agl as this is commonly the level with the highest shear magnitude when comparing it to the surface. Again, aviation forecasters should further examine the data to determine the proper "top" of the shear layer.

The program will also calculate the maximum shear magnitude for the entire forecast period. This magnitude is placed near the top of the program and compared to user defined thresholds. If criteria for "shear possible" or "shear likely" are met, an alert box will be placed near the top of the output files. Text workstation alarms can then be triggered off of the "ALERT!" text to increase situational awareness.

Notes:

1. Any questions should be directed to Jason.Schaumann@noaa.gov

2. Special thanks to Ken Pomeroy at Western Region for allowing me to utilize his code for extracting Bufkit data. I would also like to thank the staff at SGF for their feedback and suggestions, as well as MPX for testing this application.

Example Output:

```
ZCZC STLSHRSGF DDHHMM
Wind Shear Alarm Version 1.0

**********
* ALERT! *
**********


Based on NAM Bufkit model output from 30/12Z,
Low level wind shear is likely.

This message is for guidance purposes only.

Wind shear < 27 : unlikely
Wind shear >= 27 : possible
Wind shear >= 35 : likely

Highest wind shear magnitude out to 30 hours = 40 Knots

Hourly wind shear information for SGF:

Hour    Valid Time    Max Shear Mag  Sfc Wind      TAF Entry
----    ----------    -------------  --------      ---------
 00     30/12Z MON       33KTS       14014KT       WS020/19042KT
 01     30/13Z           32KTS       14015KT       WS020/19041KT
 02     30/14Z           30KTS       14018KT       WS020/18043KT
 03     30/15Z           33KTS       15020KT       WS020/18049KT
 04     30/16Z           33KTS       15022KT       WS020/18052KT
 05     30/17Z           29KTS       16023KT       WS020/17050KT
 06     30/18Z           24KTS       16023KT       WS020/17046KT
 07     30/19Z           20KTS       16022KT       WS020/17042KT
 08     30/20Z           17KTS       16022KT       WS020/16038KT
 09     30/21Z           16KTS       16020KT       WS020/16036KT
 10     30/22Z           18KTS       17017KT       WS020/17035KT
 11     30/23Z           18KTS       17017KT       WS020/17035KT
 12     31/00Z TUE       20KTS       17017KT       WS020/17037KT
 13     31/01Z           26KTS       16016KT       WS020/17041KT
 14     31/02Z           28KTS       16015KT       WS020/18042KT
 15     31/03Z           31KTS       16015KT       WS020/18044KT
 16     31/04Z           34KTS       15016KT       WS020/18048KT
 17     31/05Z           39KTS       15019KT       WS020/18054KT
 18     31/06Z           40KTS       16019KT       WS020/18056KT
 19     31/07Z           38KTS       17016KT       WS020/19053KT
 20     31/08Z           22KTS       22011KT       WS020/21032KT
 21     31/09Z           17KTS       28013KT       WS020/30028KT
 22     31/10Z           20KTS       31017KT       WS020/32036KT
 23     31/11Z           22KTS       29009KT       WS015/31030KT
 24     31/12Z           20KTS       27009KT       WS017/30027KT
 25     31/13Z           18KTS       27009KT       WS017/29026KT
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26     31/14Z          16KTS        26010KT      WS020/27026KT
27     31/15Z          10KTS        26014KT      WS020/26023KT
28     31/16Z           7KTS        25016KT      WS020/25023KT
29     31/17Z           7KTS        25018KT      WS020/25026KT
30     31/18Z           8KTS        25019KT      WS020/25027KT
```